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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,868	08/06/2001	Dmitri Loguinov	US 010359	9768

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EXAMINER

SHAH, CHIRAG G

ART UNIT PAPER NUMBER

2664

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

✓

<b>Office Action Summary</b>	Application No. 09/923,868	Applicant(s) LOGUINOV, DMITRI	
	Examiner Chirag G Shah	Art Unit 2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19, 20 and 25 rejected under 35 U.S.C. 102(e) as being anticipated by Wesley (U.S. Patent No. 6,850,488).

Referring to claims 19-20 and 25, Wesley discloses in claim 1 of a system for providing congestion control [feedback information from receivers, see claim 1, lines 32-35] in a communications network by adjusting a sender rate between at least one sender node and destination node [as disclosed in claim 1, col. 6, lines 33-44], comprising:

means for transmitting a plurality of data transmission from said source node to said destination node [as disclosed in the abstract and in claim 1, the sender transmits a stream of packets to the plurality of receivers] as discloses ;

means for determining a bandwidth capacity of said network [as disclosed in col. 3, lines 56-67 and in claim 1, the receivers return feedback messages to sender if any of the receivers experience congestion while receiving the stream of packets, thus indicating the receiver determines the bandwidth capacity of the network by sending a feedback to the sender having information indicating that the capacity of link has been exceeded in the network];

means for generating congestion feedback information based on the bandwidth capacity of said network to determine a congestion state [as disclosed in claim 1 and in col. 3, lines 56-67, the receivers generates a congestion feedback signal based on the congestion condition and sends the feedback message to the sender if there is congestion at any of the receivers] and,

means for adjusting said sender rate at which said source node is currently transmitting the data based on said congestion feedback information and the bandwidth capacity of said network [Wesley discloses in claim 1, lines 44-45 of adjusting the rate of transmission for the stream of packets in response to the feedback information and further discloses in col. 2, lines 8-13 of decreasing the rate of transmission (a predetermined criteria) if the feedback information indicates that some receivers experienced congestion while receiving packets] as claim.

Referring to claim 20, Wesley discloses in claim 1 and abstract of further comprising means (sender) for utilizing said congestion feedback information [congestion feedback information received from receivers] to determine the congestion state in said network [base on the feedback, the sender determines how to adjust the rate of transmission for the stream of packets] as claim.

Referring to claim 25, Wesley discloses in claim 1 wherein the congestion feedback information is provided by at least one of the source node and the destination node [congestion feedback is provided by the destination receiver node as in claim 1].

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-10, 12-16, 21-24, 26-28 and 30-37 rejected under 35 U.S.C. 103(a) as being unpatentable over Wesley et al. (U.S. Patent No. 6,850,488), hereinafter Wesley in view of Gupta et al. (U.S. Patent No. 6,577,599), hereinafter Gupta.

Referring to claims 1 and 26, Wesley discloses in claim 1 and the abstract of a method and a system for providing congestion control [feedback information from receivers, see claim 1, lines 32-35] in a communications network by adjusting the sender rate between a sender node and a destination node [as disclosed in claim 1, col. 6, lines 33-44], comprising:

a memory [cache 130 of figure 1] for storing a computer-readable code [as disclosed in col. 3, lines 3-6, data structures and code are typically stored on a computer readable storage medium]; and,

a processor operatively coupled to the memory [as disclosed in figure 1 and in col. 3, lines 26-35, a sender 102 can be based on any type of computer system, including , but not limited to , a computer system based on a microprocessor etc., the cache is coupled to the processor], the processor configured having the method comprising the steps of:

(a) transmitting a plurality of serial data transmission from a source node to a destination node [as in claim 1 and in col. 6, lines 23-24, and abstract, the sender processor sends a stream of packets from the sending node to a plurality of destination, receiver nodes];

(b) determining whether a congestion occurs in said network [as disclosed in claim 1 and in col. 5, lines 27-40, the receiver determines that a congestion condition has occurred, thereby sending a feedback information to the sender];

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(c) determining a bandwidth capacity of said network [as disclosed in col. 3, lines 56-67 and in claim 1, the receivers return feedback messages to sender if any of the receivers experience congestion while receiving the stream of packets, thus indicating the receiver determines the bandwidth capacity of the network by sending a feedback to the sender having information indicating that the capacity of link has been exceeded in the network];

Wesley discloses in claim 1, lines 44-45 of adjusting the rate of transmission for the stream of packets in response to the feedback information and further discloses in col. 2, lines 8-13 of decreasing the rate of transmission (a predetermined criteria) if the feedback information indicates that some receivers experienced congestion while receiving packets. Wesley explicitly fails to disclose of

(d) adjusting a sender rate at which said source is currently transmitting the data according to a first predetermined criterion if no congestion occurs; and,

(e) adjusting said sender rate of said source node according to a second predetermined criterion if congestion occurs.

Gupta discloses in figure 3 and in col. 11, lines 28-39 of sender receiving data-loss responses (feedback) submitted by receivers and determines necessary adjustments that need to be made to the transmission rate, so that the packet-loss rate is reduced. For example, if packet-loss rate is high, the transmission rate is adjusted to reduce the number of packets transmitted per unit of time; alternately, if the packet-loss rate is low an adjustment may be made, for example, to cause the transmission of greater number of packets from a sender to a receiver. Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Wesley to include the steps of adjusting the sender rate based on the

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condition of congestion such as packet loss as taught by Gupta in order to achieve optimal data transmission rate and to minimize the failure states associated with an over congested network bandwidth.

Referring to claims 9 and 33, Wesley discloses a machine-readable medium [storage device such as cache 130 in figure 1] having stored thereon data representing sequence of instructions, and the sequences of instructions [as disclosed in col. 3, lines 3-6, data structures and code are typically stored on a computer readable storage medium] which, when executed by a processor [as disclosed in figure 1 and in col. 3, lines 26-35, a sender 102 can be based on any type of computer system, including, but not limited to , a computer system based on a microprocessor etc., the cache is coupled to the processor], cause the processor to provide congestion control in a communications network, the method comprising the steps of:

(a) transmitting a plurality of serial data transmission from a source node to a destination node [as in claim 1 and in col. 6, lines 23-24, and abstract, the sender processor sends a stream of packets from the sending node to a plurality of destination, receiver nodes];

(b) monitoring a sending rate at which said source node is currently transmitting data to said network and a current rate at which said destination node is currently receiving data to determine whether a congestion state occurs [as disclosed in claim 1 and in col. 5, lines 27-40, the receiver monitors the sending rate and determines that a congestion condition has occurred, thereby sending a feedback information to the sender]; and,

Wesley discloses in claim 1, lines 44-45 of adjusting the rate of transmission for the stream of packets in response to the feedback information and further discloses in col. 2, lines 8-13 of decreasing the rate of transmission (a predetermined criteria) if the feedback information

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indicates that some receivers experienced congestion while receiving packets. Wesley fails to disclose of:

if a congestion state occurs, decreasing said sender rate of said source node according to a first predetermined criterion if congestion occurs;

if no congestion state occurs, determining the bandwidth capacity of said network, and, increasing said sender rate of said source node according to a second predetermined criterion if no congestion occurs.

Gupta discloses in figure 3 and in col. 11, lines 28-39 of sender receiving data-loss responses (feedback) submitted by receivers and determines necessary adjustments that need to be made to the transmission rate, so that the packet-loss rate is reduced. For example, if packet-loss rate is high, the transmission rate is adjusted to reduce the number of packets transmitted per unit of time; alternately, if the packet-loss rate is low an adjustment may be made, for example, to cause the transmission of greater number of packets from a sender to a receiver. Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Wesley to include the steps of adjusting the sender rate based on the condition of congestion such as packet loss as taught by Gupta in order to achieve optimal data transmission rate and to minimize the failure states associated with an over congested network bandwidth.

Referring to claims 2 and 27, Gupta discloses in figure 3 and in col. 11, lines 35-39 wherein said adjusting step (d) according to said first predetermined criterion includes increasing the number of packets transmitted by said source node as claim.



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Referring to claims 3, 10 and 28, Gupta discloses in figure 3 and col. 11, lines 28-34 wherein said adjusting step (e) according to said second predetermined criterion includes decreasing the number of packets transmitted by said source node as claim.

Referring to claims 6, 12, 24, 31, and 34, Gupta discloses in figure 3 and in col. 11, lines 28-39 wherein any adjustment of said sender rate operates to establish a maximum data transmission rate and constant packet loss.

Referring to claims 7, 13, 32, and 35, Gupta discloses in figure 3 and in col. 11, lines 28-39 wherein any said predetermined criterion [adjust to reduce the number of packets transmitted if packet-loss rate is high and adjust to increase the number of packets transmitted if packet-loss rate is low] of said adjusting step provides faster convergence to a stable operation [continued adjustments based on these criterion provides for an optimal data transmission rate].

Referring to claims 8, 14 and 36, Wesley discloses in figure 3 and in col. 4, lines 30-45 wherein said data flow from said source node is simultaneously transmitted to multiple destination nodes [sender 102 sends a multicast in the form of a stream of packet to receivers], and said bandwidth capacity is determined for each said data flow transmitted to each of said multiple destination nodes [in response to the stream of packets, sender 102 receives feedback information from receivers 111-127. These feedback messages indicate that some of the receivers are experiencing congestion and the sender may increase or decrease its rate of transmission] as claim.

Referring to claim 15, Gupta discloses in the abstract and in figure 2 of monitoring transmission and response rates. Thus, a congestion state occurs [which results in high data loss] if the rate permitted by said destination (receiver) node exceeds the capacity of said source node.

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Referring to claims 16 and 37, Gupta discloses in col. 11, lines 28-39 and abstract wherein said steps of increasing and decreasing said sender rate above and below an operating point for said network provide a maximum throughput at minimum delay time.

Referring to claim 21, Wesley discloses in claim 1 and in col. 3, lines 56-67, the receivers generates a congestion feedback signal based on the monitoring of congestion condition and sends the feedback message to the sender if there is congestion at any of the receivers. Wesley fails to disclose a means for monitoring said sending rate at which said source node is currently transmitting data to said network and a current rate at which said destination node is currently receiving data to generate said congestion control information. Gupta discloses in figure 2 and in col. 8, step 230 of monitoring transmission and response rates. Both rates as disclosed are analyzed to detect lost information packet and to determine an efficient method for their retransmission. Gupta further discloses in col. 8, lines 65-67, one or more receivers submit data-loss via control data or feedback responses to the sender. Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Wesley to include monitoring transmission and response rates as taught by Gupta in order to control traffic bandwidth and provide a proper analysis of transmission rates that enable transmission rates to be adjusted to reduce packet-loss.

Referring to claim 22, Gupta discloses in col. 11, lines 28-39 wherein, if no congestion occurs, said adjusting means increase the number of packets transmitted by said source node at a first rate and at a second rate [adjustments in rates, are continued until an optimal data transmission rate is achieved] if a predetermined range of the bandwidth capacity of said network is utilized.

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Referring to claim 23, Gupta discloses in col. 11, lines 28-34 wherein adjusting means decrease the number of packets transmitted by the source node at a predetermined rate if congestion occurs.

5. Claims 4, 5, 11, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Wesley in view of Gupta as applied to claims 1-3, 5-10, 12-16, 21-24, and 26-28, 30-37 above, and further in view of Ghanwani et al. (U.S. Patent No. 6,400,686)

Referring to claims 4, 5, 11 and 29, Wesley in view of Gupta discloses of the adjusting step (d) according to said first predetermined criterion comprises the steps of. Wesley in view of Gupta fails to disclose the steps of:

increasing and decreasing said sender rate by a specified amount at which said source node is currently transmitting the data; and,

returning said sender rate to a linear rate when a predetermined percentage of said bandwidth is utilized within said network.

Ghanwani teaches a method and apparatus for network flow control. Ghanwani discloses in col. 5, lines 28-52 of increasing and decreasing the transmission rate by a specified linear increase formula:  $r(\text{next}) = r(\text{present}) + I$ . Thus, based on the formula, the sender rate is increased by a specified amount at which the source node is currently transmitting the data. Furthermore, as disclosed in col. 4, lines 1-15, in response to the increase/decrease information, the sender calculates a new sending time and transmits at the new rate until another response message is received and eventually the rate adjustment will be done according to a linear rate change function. Therefore, it would have been obvious to modify the teachings of Wesley in view of Gupta to include the teachings of increasing and decreasing at a specified rate (formula) in order

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to modify the rate change based on feedback information returned to the source node while reducing latency.

6. Claims 17, 18, 38 and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over Wesley in view of Gupta as applied to claims 1-3, 5-10, 12-16, 21-24, and 26-28, 30-37 above, and further in view of Applicant admitted art on pages 2 and 3.

Referring to claim 17 and 38, Wesley in view of Gupta fails to disclose of the decreasing according to first predetermined criterion sender rate equation as claimed. Applicant admitted prior art on page 2-3, equation (1), (2) and (3) of the specification can be manipulated to provide the claimed equation for the decreasing congestion control scheme. Therefore, it would have been obvious to one of ordinary skills in the art to modify the teachings of Wesley in view of Gupta to include decrease congestion control scheme equation as taught by Applicant Admitted Prior Art in order to keep network load at an optimal capacity by limiting the load on the network by properly adjusting the sending rates.

Referring to claim 18 and 39, Wesley in view of Gupta fails to disclose of the decreasing according to second predetermined criterion sender rate equation as claimed. Applicant admitted prior art on page 2-3, equation (1), (2) and (3) of the specification can be manipulated to provide the claimed equation for the decreasing congestion control scheme. Therefore, it would have been obvious to one of ordinary skills in the art to modify the teachings of Wesley in view of Gupta to include decrease congestion control scheme equation as taught by Applicant Admitted Prior Art in order to keep network load at an optimal capacity by limiting the load on the network by properly adjusting the sending rates.

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***Conclusion***

**Any response to this action should be mailed to:**

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Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chirag G Shah whose telephone number is 571-272-3144. The examiner can normally be reached on M-F 6:45 to 4:15, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**Ajit Patel**  
**Primary Examiner**

cgs

March 1, 2005